- (currently amended) A method for determining formation fluid pressure in earth
 formation surrounding a borehole, the borehole defining a borehole wall, the
 borehole wall covered with mud cake forming a mud cake seal, the method
 comprising:
 - providing a tool defining a probe and a variable-volume pretest cavity fluidcoupled to the probe:
 - pressing a the probe into contact with the mud cake and formation at the borehole wall:
 - expanding the volume of a variable-volume pretest the cavity that is in fluid emmunication with the probe in sufficient amount to produce a break in the mud cake seal during a draw-down period to break a mud cake seal at the probe;
 - volume of the cavity immediately after detecting the occurrence of a the break in the mud cake seal, for a sufficient build-up period to establish pressure equilibrium between cavity fluid and formation fluid;
 - allowing a build up period to establish pressure equilibrium between tool fluid and formation fluid;
 - measuring tool pressure in the cavity; and
 - setting formation fluid pressure equal to tool measured pressure at pressure equilibrium.
- (currently amended) A method according to claim 1, wherein detecting the a
 break in the mud cake seal includes measuring tool cavity pressure and detecting
 an abrupt change associated with tool cavity pressure.
- (currently amended) A method according to claim 2, wherein detecting the abrupt change includes using a finite moving average (FMA) algorithm on a function of tool cavity pressure.

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- (currently amended) A method according to claim 3, wherein the function of tool
 cavity pressure includes a first derivative of tool cavity pressure.
- 6. (currently amended) A method according to claim 3, wherein the function of tool pressure includes a second derivative of tool cavity pressure.
- 7. (currently amended) A method according to claim 1, wherein detecting the a break in the mud cake seal includes detecting a difference between a measured tool cavity pressure and a corresponding tool cavity pressure from a reference tool cavity pressure profile.
- 8. (currently amended) A method according to claim 7, wherein the reference tool cavity pressure profile is measured in a previous drawdown with the cavity isolated from the formation.
- (original) A method according to claim 1, further comprising:
 expanding the volume of the cavity during the draw-down period at a predetermined constant rate.
- 10. (original) A method according to claim 9, wherein the predetermined constant rate is within the range of 3-160cc/minute.
- 11. (original) A method according to claim 10, wherein the predetermined constant rate is approximately 5cc/minute.

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(currently amended) A tool for determining formation fluid pressure in earth 12. formation surrounding a borehole, the borehole defining a borehole wall, the borehole wall covered with mud cake forming a mud cake seal, the tool comprising:

an elongated body adapted for downhole operation;

- a probe, extendable from the elongated body, the probe defining an inflow aperture;
- a pretest piston pump defining a variable-volume pretest cavity coupled to the inflow aperture;
 - a) means for expanding the volume of the pretest cavity in sufficient amount to produce a break in the mud cake seal,
 - b) means for detecting an occurrence of a break in the mud cake seal, and
 - c) means for holding constant the volume of the cavity immediately after detecting the occurrence of the break in the mud cake seal, for a sufficient build-up period to establish pressure equilibrium between pretest cavity fluid and formation fluid;

and

a pressure sensor coupled to measure pressure in the pretest cavity. a pretest flow line coupling the inflow aperture to the cavity; pressure measuring means, pressure coupled to the cavity for measuring tool pressure; and

electromechanical control means for controlling the volume of the cavity.

- (original) A tool according to claim 12, wherein the control means includes an 13. electromechanically driven roller screw planetary system.
- (original) A tool according to claim 13, wherein the control means further 14. includes an electrically driven gearbox coupled to drive the roller screw planetary system.

- 15. (original) A tool according to claim 12, wherein the control means includes downhole programmable control electronics coupled to control the electromechanical control means.
- 16. (original) A tool according to claim 12, wherein the tool includes a constant-volume flow line.
- 17. (original) A tool according to claim 16, wherein the constant-volume flow line includes a dedicated probe.
- 18. (original) A tool according to claim 16, wherein the constant-volume flow line includes a flexible conduit.
- 19. (original) A tool according to claim 16, wherein the constant-volume flow line has a volume in the range 20 120cc.
- 20. (original) A tool according to claim 12, wherein the probe is located between the pressure measuring means and the variable-volume pretest cavity.
- 21. (original) A tool according to claim 12, further comprising a sample line coupled to the cavity, and an isolation valve located between the cavity and the sample line.
- 22. (original) A tool according to claim 12, further comprising an isolation valve located between the cavity and the formation fluid inflow aperture.
- 23. (original) A tool according to claim 12, wherein said electromechanical control means includes means for terminating expansion of the volume of the cavity on detecting a break in a mud cake seal.